

Customer No.: 31561  
Docket No.: 1259S-US-PA  
Application No.: 10/711,622

REMARKS

Present Status of the Application

The Office Action rejected claims 1-21, 26 and 28 under 35 U.S.C. 103(a) as being unpatentable over Pham (US 2002/0077053) in view of Jensen (US 6,261,168). Claims 1-21, 26 and 28 are objected to because "and the region" in claims 1 and 11 is not clear.

Applicant has amended claims 1-4, 9-11 and 13-15 and canceled claims 26 and 28 to more clearly define the present invention. After entry of the foregoing amendments, claims 1-4, 6-21 remain pending in the present application, and reconsideration of those claims is respectfully requested.

Claim Objection

Claims 1-21, 26 and 28 are objected to because "and the region" in claims 1 and 11 is not clear. Applicant has amended "a region" into "a stress buffer region" and amended "the region" into "the stress buffer region" in the claims to overcome the objection.

Rejection under 35 U.S.C 103 (a)

*Applicant respectfully traverses the rejection of claims 1-4 and 6-21 under 103(a) as being unpatentable over Pham (US 2002/0077053) in view of Jensen (US 6,261,168) because a prima facie case of obviousness has not been established by the Office Action.*

To establish a prima facie case of obviousness under 35 U.S.C. 103(a), each of three requirements must be met. First, the reference or references, taken alone or

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combined, must teach or suggest each and every element in the claims. Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skilled in the art, to combine the references in a manner resulting in the claimed invention. Third, a reasonable expectation of success must exist. Moreover, each of the three requirements must "be found in the prior art, and not be based on applicant's disclosure." See M.P.E.P. 2143, 8<sup>th</sup> ed., February 2003.

The present invention is in general related a polishing pad and a method for fabricating a polishing pad as claims 1 and 11 recite:

Claim 1. A polishing pad having a top surface, a back surface, and a sidewall connected to the top surface and the back surface, and the polishing pad is divided into a polishing region and a stress buffer region neighboring to the polishing region, and the stress buffer region is at the center or edge of the polishing pad, characterized in that:

*at least one stress buffer pattern disposed in the stress buffer region* neighboring to the polishing region, wherein the stress buffer pattern comprises a plurality of trenches or at least one opening *having a first depth* less than a thickness of the polishing pad; and

*a plurality of trenches with a second depth disposed on the top surface in the polishing region, wherein the first depth is greater than the second depth.*

Claim 11. A method for fabricating a polishing pad having a top surface, a back surface, and a sidewall connected to the top surface and the back surface, and the polishing pad is divided into a polishing region and a stress buffer region neighboring to the polishing region, and the stress buffer region is at the center or edge of the polishing pad, the method comprising:

*forming a stress buffer pattern in the stress buffer region* neighboring to the polishing region, wherein the stress buffer pattern comprises a plurality of trenches or at least one opening *having a first depth* less than a thickness of the polishing pad; and

*forming a plurality of trenches with a second depth on the top surface in the polishing region, wherein the first depth is greater than the second depth.*

Pham (US 2002/0077053) discloses a polishing belt, as shown in Fig. 1, having a

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first surface 28 and a second surface 32. In particular, grooves 32 are formed in the second surface 32. The grooves 32 enable the second surface 32 to flex and linearly compress as the polishing belt rotates around the rollers 40, 42 (see paragraph [0020]). As the drawings shown, *the grooves 32 are formed in the whole second surface 32* of the polishing belt such that and the grooves 32 can enable the second surface 32 to flex and linearly compress as the polishing belt rotates around the rollers 40, 42. However, in claims 1 and 11 of the present invention, *the stress buffer pattern is disposed/formed in the stress buffer region* but not formed in the whole surface of the polishing pad.

Furthermore, *Pham does not teach there are trenches on the top surface in the polishing region* as claims 1 and 11 recites. Pham just discloses the first surface 28 is oriented such that it can contact a wafer to polish the wafer (see paragraph [0019]). However, the polishing pad of claims 1 and 11 comprises trenches on the top surface of the polishing pad in the polishing region, and the depth of the stress buffer pattern is greater than the depth of the trenches. Pham fails to teach the features as above mentioned.

On the other hand, Jensen (US 6,261,168) discloses a polishing pad having a plurality of polishing sections 12. Each polishing section is formed with its own respective groove pattern 16a-16c. As the drawings shown, the groove pattern 16a-16c is respectively formed in the whole polishing section. Moreover, Jensen also teaches *the groove pattern is preferably uniform within a pad section 12 so that the width, depth and pitch are the same* for grooves within a particular pad section (see col. 3, lines

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31-34). In other words, the groove pattern formed at the central, edge and a region therebetween (that is the whole region) of the polishing pad section is uniform in width, depth and pitch. However, in claims 1 and 11, the depth of the stress buffer pattern in the stress buffer region is greater than the second depth of the trenches on the top surface in the polishing region, wherein the stress buffer region is at the center or edge of the polishing pad.

Therefore, Pham and Jensen fail to teach or suggest that the depth of the stress buffer pattern in the stress buffer region is greater than the second depth of the trenches on the top surface in the polishing region as claims 1 and 11 recite. In particular, as disclosed in the specification of the present invention (see paragraphs [0026], [0027], [0032], [0033] and [0037]), the function of the stress buffer pattern, with greater depth than the depth of the trenches in the polishing region, is to buffer the compressing stress due to the swing motion of the wafer. Hence, it prevents the surface of the stress buffer region from being protruded and thus prevents from rubbing against the wafer carrier, so that contamination of the surface of the wafers due to particles generated from the rubbing can be avoided. Therefore, the two references do not teach or suggest each and every element in the independent claim 1 and 11.

Additionally, in the Pham reference, designing the grooves 32 is for enabling the second surface 32 to flex and linearly compress as the polishing belt rotates around the rollers 40, 42. However, In the Jensen reference, the polishing pad having polishing sections is characterized by at least two different removal profiles, and the resulting pad

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has a more uniform material removal rate across a semiconductor wafer. The purposes of the two references are much different. There is not any "suggestion, teaching, or motivation" that would have led a person of ordinary skill in the art to combine the relevant prior art teachings in the manner claimed. In holding an invention obvious in view of a combination of references, there must be some suggestion, motivation, or teaching in the prior art that would have led a person of ordinary skill in the art to select the references and combine them in the way that would produce the claimed invention (*Karsten Mfg. Corp. v. Cleveland Golf Co.*, 242 F.3d 1376, 1385 (Fed. Cir. 2001)). When the references are in the same field as that of the applicant's invention, knowledge thereof is presumed. However, the test of whether it would have been obvious to select specific teachings and combine them as did the applicant must still be met by identification of some suggestion, teaching, or motivation in the prior art, arising from what the prior art would have taught a person of ordinary skill in the field of the invention (*In re Dance*, 160 F.3d 1339, 1343 (Fed. Cir. 1998)).

For at least the foregoing reasons, Applicant respectfully submits a prima facie case of obviousness for claims 1 and 11 has not been established by the Office Action. Independent claims 1 and 11 patently define over the prior art references, and should be allowed. For at least the same reasons, dependent claims 2-4, 6-10, 12-21 patently define over the prior art as a matter of law.

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CONCLUSION

In view of the foregoing, Applicants respectfully request continued examination of the above-identified patent application. It is believed that the pending claims are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the application, the Examiner is invited to call the undersigned.

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Respectfully submitted,

*Belinda Lee*  
Belinda Lee

Registration No.: 46,863

Jianq Chyun Intellectual Property Office  
7<sup>th</sup> Floor-1, No. 100  
Roosevelt Road, Section 2  
Taipei, 100  
Taiwan  
Tel: 011-886-2-2369-2800  
Fax: 011-886-2-2369-7233  
Email: [belinda@jcipgroup.com.tw](mailto:belinda@jcipgroup.com.tw)  
[Usa@jcipgroup.com.tw](mailto:Usa@jcipgroup.com.tw)